

ABSTRACT

A zinc oxide (ZnO) field effect transistor exhibits large input amplitude by using a gate insulating film. A channel layer and a gate insulating film are sequentially laminated on a substrate. A gate electrode is formed on the gate insulating film. A source electrode and a drain electrode are disposed at the both sides of the gate electrode and are electrically connected to the channel layer via openings. The channel layer is formed from n-type ZnO. The gate insulating film is made from aluminum nitride / aluminum gallium nitride (AlN/AlGaN) or magnesium zinc oxide (MgZnO), which exhibits excellent insulation characteristics, thus increasing the Schottky barrier and achieving large input amplitude. If the FET is operated in the enhancement mode, it is operable in a manner similar to a silicon metal oxide semiconductor field effect transistor (Si-MOS-type FET), resulting in the formation of an inversion layer.